Hong Kong's Indoor Air Quality Rating System

Just as Los Angeles County publicly posts letter grades reflecting the quality of retail food establishments, workers and consumers should be informed of the quality of the air in the indoor spaces in which they work or visit. The city of Hong Kong is leading the world with its implementation of an Indoor Air Quality (IAQ) Certification "Scheme" (program) to publicly attest to the quality of the air in offices and public places such as shopping malls, cinemas, restaurants, and public transport facilities.

Hong Kong's Motivation

Beginning in the late 1980's and through the 1990's, the government of Hong Kong held hearings on the air quality of the city's private and public buildings. Ultimately, in 1995, the Hong Kong government commissioned a private consulting firm to conduct an 18-month study, focusing on 40 public and private office buildings.

Motivated by those results, Hong Kong in 2000 established a voluntary certification process that designates a building's IAQ class as either "Good" or "Excellent". The IAQ Certification Program is part of an overall "IAQ Management Programme" that includes:

- a public education and publicity campaign to promote public awareness of IAQ;
- an IAQ Information "Centre" to disseminate information and reference materials related to IAQ;
- a set of IAQ Objectives as a common benchmark for evaluating and assessing IAQ;
- a set of Guidance Notes for the better management of IAQ in offices and public places;
- a voluntary IAQ certification program;

Hong Kong has adopted a voluntary and self-regulatory approach to support annual IAQ building certification. For building owners and managers, the program provides a way to gain public recognition of a building's superior air quality and thus potentially attract more tenants or customers aware of the enhanced health benefits, reduced medical benefits costs and the increased worker productivity associated with superior IAQ.

Hong Kong's IAQ guidelines were based in part on standards established, recommended, or under consideration by the World Health Organization (WHO) and the governments of Australia, Canada, Finland, Japan, Singapore, South Korea, Sweden, the United Kingdom, and the United States. Below are the parameters that a building's indoor spaces must meet in order to rated as having "good" or "excellent" IAQ. For comparison purposes, I've included the Indoor Air Quality Association's (IAQA) "Recommended Guidelines 01-2000".

Parameter	Units	Excellent Class-Hong Kong	Good Class-Hong Kong	Source	IAQA-01-2000	Source
Room Temperature	°F	68 to 78	< 78°	Hong Kong Electrical and Services Dept	Summer-73-79° Winter-68-74.5°	ASHRAE 55
Relative Humidity	%	40 to < 70%	< 70%	"Excellent" - Japan and Korea	30-65%	Florida Dept of Management Services
Air Movement	m/s	< 0.2	< 0.3		.25	WHO
Carbon Dioxide	ppm	< 800	< 1,000	• "Excellent" - EPA • "Good"- ASHRAE, Australia, Canada, Japan, Korea, Singapore, Sweden, and Norway	650ppm over ambient	ASHRAE 62-1989
Carbon Monoxide	ppm	< 1.7	< 8.7	• "Excellent"- Finland • "Good"- WHO	9	EPA-National Ambient Air Quality Standard
Respirable Suspended Particulates	$\mu g/m^3$	< 20	< 180	"Excellent"- Finland	50	California Air Resources Board
Nitrogen Dioxide	$\mu g/m^3$	< 40	< 150	"Excellent"-WHO "Good"-Hong Kong Environmental Protection Dept.		
	ppb	< 21	< 80			
Ozone	ppb	< 25	< 61	• "Excellent"- Finland • "Good" WHO	5	WHO
Formaldehyde	$\mu g/m^3$	< 30	< 100	• "Excellent"- Finland • "Good"- WHO	60	Health & Welfare Canada
	ppb	< 24	< 81		50	
Total Volatile Organic Compounds	$\mu g/m^3$	< 200	< 600	"Excellent" and "Good"- Finland	300	Molhave, 1990- Institute of Environmental & Occupational Medicine
	ppb	< 87	< 261		640	
Radon	Bq/m^3	< 150	< 200	• "Excellent" - EPA	4 picoCuries per liter	EPA

Parameter	Units	Excellent Class-Hong Kong	Good Class-Hong Kong	Source	IAQA-01-2000	Source
				• "Good"- Finland		
Airborne Bacteria	cfu/m^3	< 500	< 1,000	ACGIH	500 total; dominated by Gram+ organisms	WHO

Step on up!

As of April 2004, 32 sites have been certified as "Good", and 2 sites have been certified as "Excellent" under Hong Kong's IAQ Certification Program. Of those sites 5 good and 1 excellent are private, the rest being public buildings. I asked Josephine HO, a Hong Kong Environmental Protection Officer, about private sector participation and reaction to the IAQ "Scheme". She replied: " Since the IAQ Certification Scheme is a relatively new programme in Hong Kong, the private sector would take some time to obtain the necessary professional advice and make their own IAQ plan before seeking certification. We are seeing more and more private premises applying for certification. The public response to the IAQ Programme has been positive."
With Hong Kong's IAQ certification program and the Green Building Council's LEED program there are two opportunities for building owners to sing the superior quality praises of their properties. With LEED squarely addressing sustainability issues and Hong Kong's certification program seeking to advance improved Indoor Air Quality, today's knowledge workers should be more effective and thus more profitable in LEED and IAQ Certified spaces. Since corporate decisions are profit driven, studies done by William Fisk[1] and others show that workers in building with improved ventilation are healthier and more productive. With the Olympian burst of LEED "Gold Green Buildings" a voluntary IAQ certification program seems like a natural extension.

The IAQ Information Centre
As part of the IAQ Certification Program, Hong Kong has an IAQ center where the public can find information on how IAQ issues affect them. The center distributes brochures and maintains a web site- (http://www.iaq.gov.hk/index_eng.asp). I asked Ms. Ho about the air purification methods used in the IAQ center: "The IAQ Information Centre is using HEPA as well as photocatalytic oxidation filtration. However, we do not rely solely on air purifier to improve air quality in the Centre. We advocate the importance of controlling emissions at source rather than end-of-pipe control. Hence low emission paints, adhesives, carpets and furniture were used in the Centre. " That sounds just like the Green Building Council's L.E.E.D. IEQ requirements.

Over Here?

Hong Kong's IAQ Certification Scheme shows that indoor air quality in public spaces can be addressed using creative and voluntary methods. Hong Kong has shown that with the Local Government setting the example, private landlords can embrace public certification of indoor air quality as a way to differentiate their properties. I'm interested to see how market pressures will motivate other landlords to certify their building's IAQ.

The next important task is to establish an IAQ Certification Program here in the US. Can the IAQA implement a voluntary IAQ Certification through its guidelines committee and update the current IAQA 01-2000? Will legal and/or economic pressures derail a Hong Kong-like program here in the US? I'm convinced that a voluntary Certification program may be the best plan for success. The citizens of Hong Kong are already benefiting from the improved IAQ in the Certified buildings there: Let's just do it here.

1. Association of Ventilation Type with SBS in Office Workers. Indoor Air 2002 (12) 98-112

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